2010 Military Health System Conference

Toward the Meaningful Use of EHRs - More Than Just a Health Record

Sharing Knowledge: Achieving Breakthrough Performance

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26 January 2010

WRNMMC

Strategic Alignment

- Increased readiness
- Enhanced experience of care
- Improved population health
- Responsible management of per capita cost

Rationale

- Unrecognized chronic kidney disease (CKD) is a major risk factor for iatrogenic (ie, avoidable) patient adverse events and potentially compensable events.
- Prevalence of significant (stage 3 or 4) CKD nationally is estimated at 6.3-18.6% (14-40 million people nationally), with estimated Medicare costs of $9 billion (AJKD, 2009)
- As of 2006, 26% of physician offices and 44% of hospitals reported eGFR from Scr

Rationale (cont'd)

- CKD is defined using: serum creatinine level, age, gender, and race (ie, built-in "gold standard").
- In all health systems studied so far, the majority of patients with CKD which could be readily identified from above are NOT recognized by their providers as having CKD, based on coding or diagnosis
- Improving patient (and therefore provider) awareness of CKD diagnosis is key Healthy People 2020 Objective

Rationale (cont'd)

- Patients with CKD can be inadvertently harmed by inappropriate use/dosing of medications (NSAID's, metformin as examples), radiological contrast, and procedures (esp certain surgeries)
- CKD coexists with many other conditions (diabetes, heart failure, etc) and is a risk multiplier
- Acute kidney injury can result from medications or other medical treatment and can result in CKD

Perspective

- Our service has previously investigated national and DOD data to assess outcomes related to CKD

Perspective

JASN Express. Published on October 31, 2007 as doi: 10.1681/ASN.2007030349

CLINICAL RESEARCH www.jasn.org

Association of Oral Sodium Phosphate Purgative Use with Acute Kidney Injury

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ABSTRACT

Oral sodium phosphate (OSP) is a commonly used purgative before colonoscopy. There have been numerous reports of acute phosphate nephropathy attributed to the use of OSP. This study evaluated the association between the use of OSP and acute kidney injury (AKI) in an observational, retrospective, cohort study. Of 9799 patients who underwent colonoscopy and had serum creatinine values recorded within 365 days before and after the procedure, AKI, defined as ≥50% increase in baseline serum creatinine, was identified in 114 (1.16%). After adjustment for significant covariates in a multiple logistic regression model, the use of OSP was associated with increased risk for AKI (odds ratio 2.35; 95% confidence interval 1.51 to 3.66; $P < 0.001$) with an adjusted number need to harm of 81. Age was also independently associated with AKI in this cohort; therefore, until larger, prospective studies define the population at risk for acute phosphate nephropathy, the use of polyethylene glycol-based purgatives should be considered for older patients and possibly for those with comorbid medical conditions.

J Am Soc Nephrol 18: –, 2007. doi: 10.1681/ASN.2007030349

Oral sodium phosphate (OSP) solution is commonly used for colorectal cleansing for colonoscopy. The total 90-ml dose contains approximately 10 g (111 mg/ml) of sodium and 11.5 g (4 mmol/ml) of phosphorous.[1] Its use is contraindicated in patients with preexisting renal disease because of the risk for developing renal failure or electrolyte disturbances.[2]

[NSAID], angiotensin-converting enzyme inhibitors [ACEI], angiotensin receptor blockers [ARB], and diuretics) have been suggested as possible risk factors for the development of APN after use of OSP purgatives.[9]

In May 2006, the Food and Drug Administration published an alert regarding the use of this medication.[11] They reported 20 additional cases of possible

Perspective

Assessment of Racial Disparities in Chronic Kidney Disease Stage 3 and 4 Care in the Department of Defense Health System

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Background and objectives: Racial disparities in provision of healthcare are widespread in the United States but have not been specifically assessed in provision of chronic kidney disease (CKD) care.

Design, setting, participants, & measurements: We conducted a retrospective cohort study of the clinical database used in a Department of Defense (DOD) medical system. Beneficiaries studied were DOD-eligible beneficiaries with CKD stage 3 ($n = 7729$) and 4 ($n = 589$) using the modified Modification of Diet in Renal Disease (MDRD)-estimated GFR formula but requiring manual correction for Black race. Compliance with selected Kidney Disease Outcomes Quality Initiative (KDOQI) CKD recommended targets (monitoring of recommended laboratory data, prescription of recommended medications, and referral to nephrology) was assessed over a 12-mo period, stratified by CKD stage. Logistic regression analysis was used to assess whether race (White, Black, or other) was independently associated with provider compliance with targets, adjusted for demographic factors and burden of comorbid conditions.

Results: Among the targets, only monitoring of LDL cholesterol was significantly less common among Blacks. For all other measures, compliance was either not significantly different or significantly higher for Black compared with White beneficiaries. However, patients categorized as "Other" race were in general less likely to achieve targets than Whites, and at stage 3 CKD significantly less likely to achieve targets for monitoring of phosphorous, hemoglobin, and vitamin D.

Conclusions: In the DOD health system, provider compliance with selected CKD stage 3 and 4 targets was not significantly lower for Black beneficiaries than for Whites, with the exception of LDL cholesterol monitoring. Patients classified as Other race were generally less likely to achieve targets than Whites, in some patients significantly so.

Clin J Am Soc Nephrol 3: 442-449, 2008. doi: 10.2215/CJN.03940907

Numerous studies have documented racial disparities in provision of health care for Black, as compared with White Americans. Blacks have been shown to experience higher mortality, less access to care, higher risk of renal disease progression, fewer referrals for renal transplantation, and shorter renal allograft survival than Whites (1–5). Some programs aimed at enhancing access to care have shown improvements in this health gap (6,7). The common theme of such interventions is the amelioration of financial, socioeconomic, and other (occasionally including transportation) barriers to access and care.

Medical care in the DOD direct care system is provided without cost and without the need for qualification based on existing conditions. If differences in care between Blacks and Whites observed in the United States are at least in part due to differences in insurance coverage or other financial factors, Black and White beneficiaries in the DOD health system should have less racial disparity in care provided by a similar group of primary care physicians and nephrologists than reported nationally.

Because previous reports on racial disparities in provided care have focused on Blacks and Whites, our objective was to perform a retrospective cohort study of a clinical/administrative healthcare database to assess the nephrology care provided to White and Black beneficiaries with CKD stages 3 and 4 in the DOD's National Capital Area (NCA) health system. Nephrology care was assessed per the National Kidney Foundation's (NKF) K/DOQI guidelines. Our null hypothesis was that there

Received September 20, 2007. Accepted November 9, 2007.

Published online ahead of print. Publication date available at www.cjasn.org.

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Disclaimer: The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the Department of the Navy or Army, Department of Defense, nor the US Government.

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ISSN: 1555-9041/302-0442

Provider awareness of CKD

- As of 2002-2003, ICD-9 codes for chronic renal failure were changed to “chronic kidney disease”, in response to suggested changes in nomenclature by national nephrology organizations.
- In 2005, these codes were modified to include specific stages of CKD.
- It was therefore possible to compare rates of coding to a “gold standard” already available in DOD records

Provider awareness of CKD

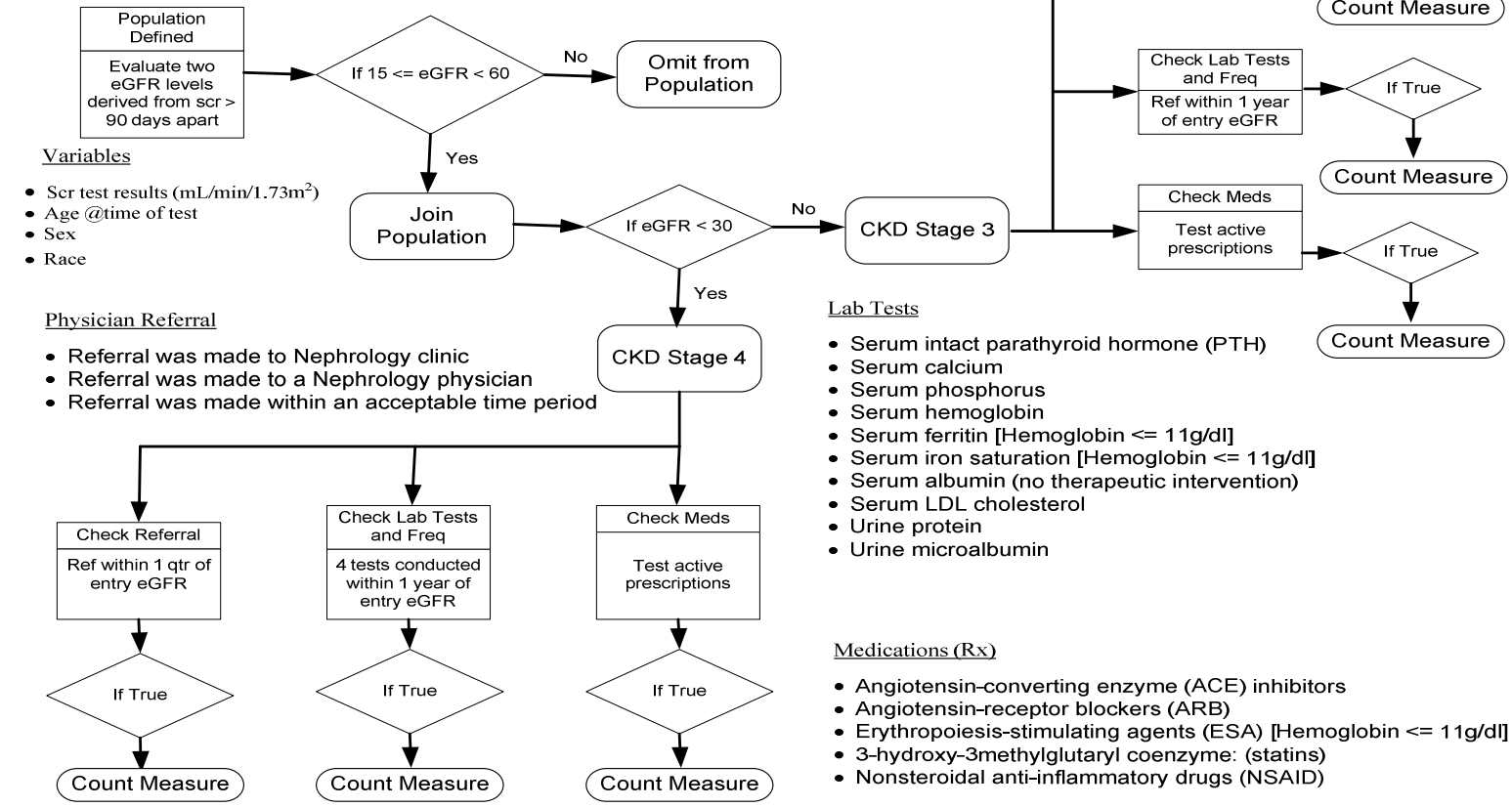
- Objectives: determine baseline rates of provider awareness of CKD diagnosis
- In the process, explore issues related to data quality and standardization
- Up front: the estimated level of kidney function (eGFR) was not reported in a standardized fashion throughout DOD and still isn't today

Provider awareness of CKD

Nephrology Clinical Practice Guidelines & Performance Measures

Equation

[KDOQI] $eGFR = 186 * scr^{(-1.154)} * age^{(-0.203)} * 0.742$ *(if female)* $* 1.210$ *(if African American)*



Variables

- Scr test results (mL/min/1.73m^2)
- Age @time of test
- Sex
- Race

Physician Referral

- Referral was made to Nephrology clinic
- Referral was made to a Nephrology physician
- Referral was made within an acceptable time period

Lab Tests

- Serum intact parathyroid hormone (PTH)
- Serum calcium
- Serum phosphorus
- Serum hemoglobin
- Serum ferritin [Hemoglobin <= 11g/dl]
- Serum iron saturation [Hemoglobin <= 11g/dl]
- Serum albumin (no therapeutic intervention)
- Serum LDL cholesterol
- Urine protein
- Urine microalbumin

Medications (Rx)

- Angiotensin-converting enzyme (ACE) inhibitors
- Angiotensin-receptor blockers (ARB)
- Erythropoiesis-stimulating agents (ESA) [Hemoglobin <= 11g/dl]
- 3-hydroxy-3methylglutaryl coenzyme: (statins)
- Nonsteroidal anti-inflammatory drugs (NSAID)

Provider awareness of CKD

Diagnosis Category	Qty	By: Coding	Labs
CHRONIC KIDNEY DISEASE (CKD)	9738	1.53%	8.80%
CONGESTIVE HEART FAILURE (CHF)	9517	1.50%	
CORONARY ARTERY DISEASE (CAD)	34945	5.49%	
DIABETES	164708	25.89%	
DIABETES WITH RENAL	4099	0.64%	
HYPERTENSION	409120	64.31%	
HYPERTENSION + CHF	2782	0.44%	
HYPERTENSION + CKD + CHF	316	0.05%	
KIDNEY WITH HYPERTENSION	972	0.15%	
Sum:	**636197**		

The figure in red for CKD indicates the percentage if based on labs.
Multiple diagnoses per patient are possible.

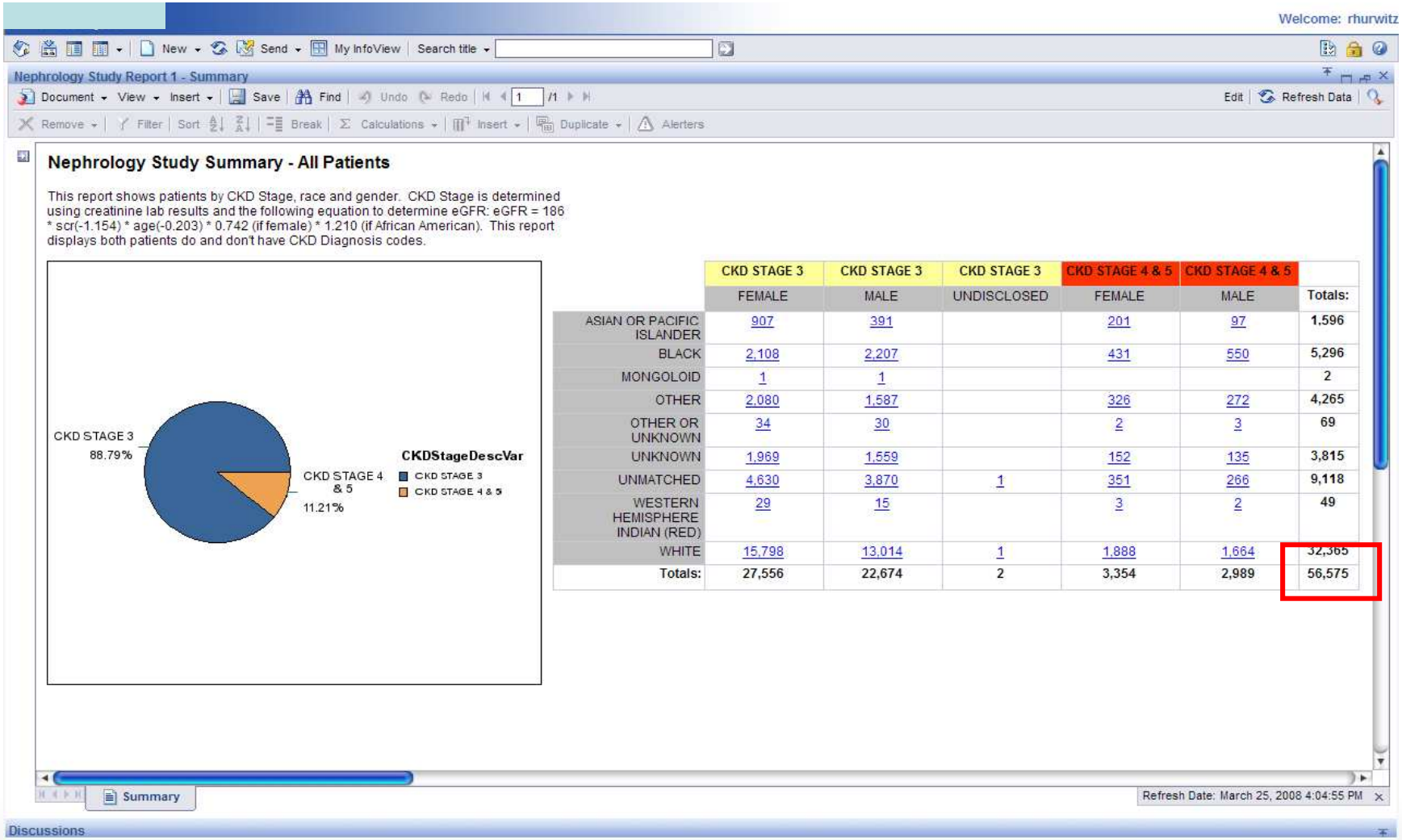
Provider awareness of CKD

- Of the 56,575 cases where a diagnosis of CKD derived from serum creatinine value by MDRD formula (gold standard), only 21.1% had ICD-9 codes for CKD (compared to 15.2% reported in Italian studies). Rates were 17% for stage 3 and 49% stage 4-5—this compares with rates of 11% and 39%, respectively, reported in American Series.

Provider awareness of CKD

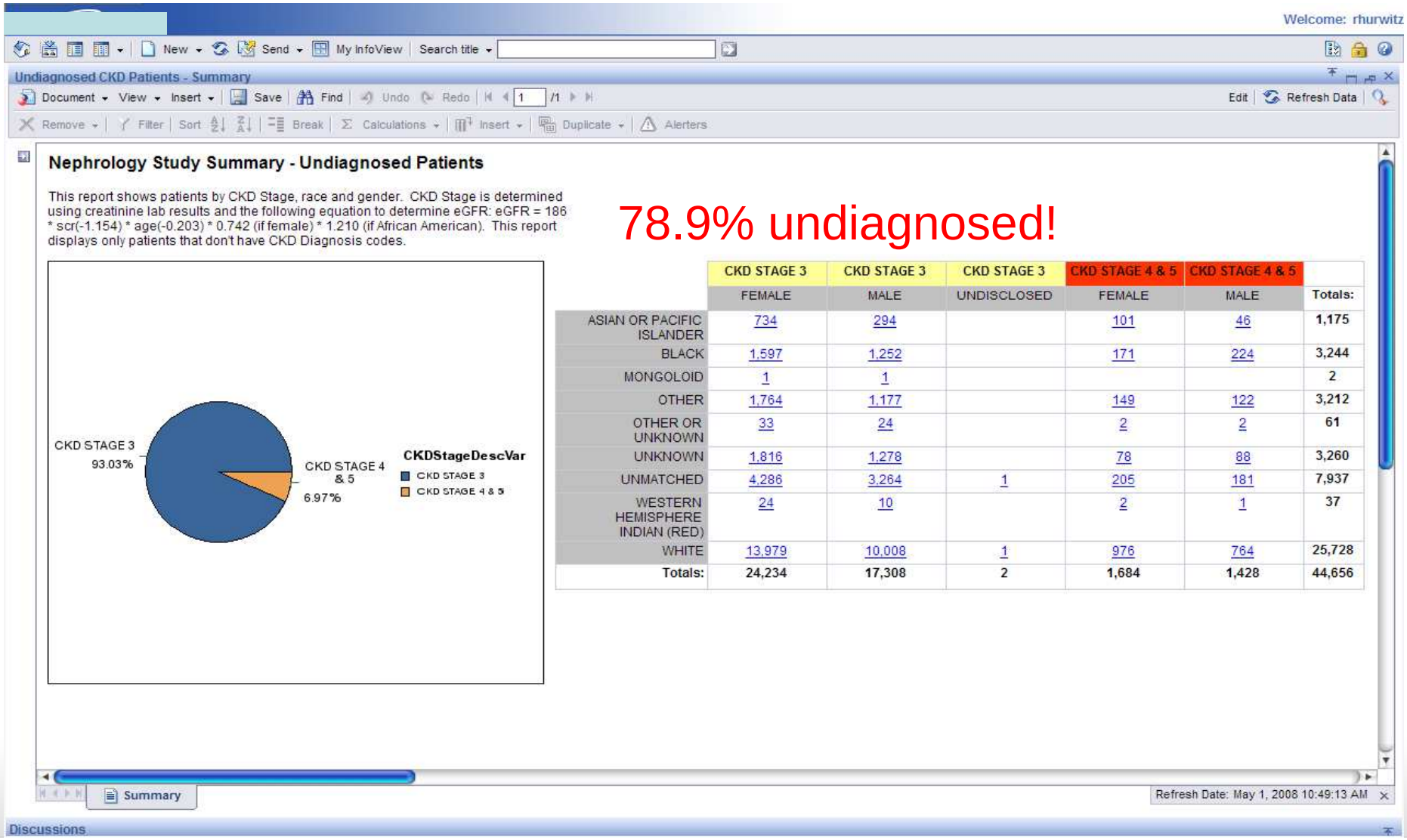
- Race data was unknown or missing for 48.2% of the cohort (13% for DDEAMC, 23% for Walter Reed, 36% for BAMC, 43% for MAMC, 49% for TAMC, 47% for WBAMC, as an example)
- In the event race data was unknown, the correction factor for race was not included in the formula (ie patient assumed to be nonblack)

Provider awareness of CKD



	CKD STAGE 3 FEMALE	CKD STAGE 3 MALE	CKD STAGE 3 UNDISCLOSED	CKD STAGE 4 & 5 FEMALE	CKD STAGE 4 & 5 MALE	Totals:
ASIAN OR PACIFIC ISLANDER	907	391		201	97	1,596
BLACK	2,108	2,207		431	550	5,296
MONGOLOID	1	1				2
OTHER	2,080	1,587		326	272	4,265
OTHER OR UNKNOWN	34	30		2	3	69
UNKNOWN	1,969	1,559		152	135	3,815
UNMATCHED	4,630	3,870	1	351	266	9,118
WESTERN HEMISPHERE INDIAN (RED)	29	15		3	2	49
WHITE	15,798	13,014	1	1,888	1,664	32,365
Totals:	**27,556**	**22,674**	**2**	**3,354**	**2,989**	**56,575**

Provider awareness of CKD



	CKD STAGE 3 FEMALE	CKD STAGE 3 MALE	CKD STAGE 3 UNDISCLOSED	CKD STAGE 4 & 5 FEMALE	CKD STAGE 4 & 5 MALE	Totals:
ASIAN OR PACIFIC ISLANDER	734	294		101	46	1,175
BLACK	1,597	1,252		171	224	3,244
MONGOLOID	1	1				2
OTHER	1,764	1,177		149	122	3,212
OTHER OR UNKNOWN	33	24		2	2	61
UNKNOWN	1,816	1,278		78	88	3,260
UNMATCHED	4,286	3,264	1	205	181	7,937
WESTERN HEMISPHERE INDIAN (RED)	24	10		2	1	37
WHITE	13,979	10,008	1	976	764	25,728
Totals:	24,234	17,308	2	1,684	1,428	44,656

Conclusions

- Provider awareness of CKD diagnosis was low in DOD although consistent with other health systems: plenty of room for improvement
- In the process, uncovered opportunities for improvement in reporting of race and other data, as well as standardized reporting of kidney function.

Conclusions

- Next steps would be to address shortfalls and reassess to see if provider awareness has improved, and assess other outcomes in CKD.